REMARKS

In order to emphasize the patentable distinctions of applicant's invention over the prior art, claim 1 (and claims 2-13, dependent thereon) have been amended to recite that the amorphous material is subjected to selected forces that induce permanent deformation. Such selected forces cause 3-dimensional features to be formed on a planar, nominally 2 dimensional, amorphous material. Claim 10 has been deleted, without prejudice to expedite the prosecution process. Claims 4 and 5 have been amended to recite that the amorphous alloy is defined by the formula set forth therein. Each of these amendments is clearly supported by the original specification. A redline documents highlighting the amendments to the claims and an unmarked (clean) copy of the amended claims are enclosed herewith.

The Examiner has required restriction under 35 U.S.C. § 121 between the following inventions:

Group I. Claims 1-13, drawn to a product, classified in class 148, subclass 304; and

Group II. Claims 14-19, drawn to a process, classified in class 148, subclass 561.

In response to the restriction requirement, applicants elect, with traverse, the invention of Group I, claims 1-13, for further prosecution on the merits.

Reconsideration of this restriction requirement is respectfully requested. The Examiner has stated that the inventions, as grouped, are separate and distinct because the product, as claimed, can be made by a materially different process, such as by using a quench wheel of a defined surface configuration. Yet the relationship between (i) the amorphous metal alloy article having an articulated topographical definition, and (ii) the process for manufacturing the article, is an interdependent one, there being the same physical and structural concepts in the broad aspect of the invention.

More specifically, the product of claims 1-13, as amended, is restricted to an article produced by a particular process. That process requires the preparation of geometrically articulated amorphous alloys by applying force to permanently deform a planar amorphous sheet. It does not

includes products produced by direct quenching from a melt. The products, which result from application of selected forces to induce permanent deformation, produce 3-dimensional shapes from a generally planar 2-dimensional ribbon. These geometrically articulated amorphous metal shapes are structurally relaxed due to the absence of directional thermal contraction stresses. As a result, the geometrically articulated amorphous metal shapes are endowed with superior mechanical properties, including exceptional cutting capability and excellent magnetic properties. On the other hand, as quenched products said to have geometrical articulation are in an un-relaxed state, as shown in Fig. 1 of the specification. They do not possess superior magnetic properties or cutting properties, since internal stresses are additive to applied stresses. The magnetic and mechanical properties of geometrically articulated amorphous material produced by mechanical forming processes of the subject invention are superior to properties produced by direct quench methods. In addition, casting angular articulation, similar to hexagonal geometrical articulation as shown in Fig. 2A, generally results in poor reproduction due to melt accumulation along angular edges. This melt accumulation behavior, as well as the poor reproduction of the pattern, is acknowledged by USP 4,322,848 to Narasimhan (see col. 1 line 60 through col. 2 line 17). By way of contrast, the mechanical deformation process used to produce applicant's product does not have any of these limitations, since the metallic glass essentially flows along the shape of the die. Moreover, non-periodic structures cannot be produced by the process disclosed in Narasimhan, since the geometrically articulated amorphous metal invariably has a periodicity, created by the circumference of a quench wheel or belt. Clearly, the process for manufacturing geometrically articulated amorphous alloys by applying force to cause permanent deformation, as well as the products made therefrom result in novel features. Significantly, these novel features are shared by each of the Group I and II inventions.

It is well established that applicants should be allowed reasonable latitude in claiming their invention, provided they do not unduly multiply the claims, which is not the case here. Ex parte Seiback 151 U.S.P.Q. 62. It is submitted that the fields of search involved in examining the claims

as grouped would, as a practical matter, be essentially co-extensive and the best interests of the public, would be served by having all of the claimed subject matter in the same application.

Accordingly, reconsideration of the restriction requirement is respectfully requested.

Claims 1-13 were rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner has stated that the term "articulated topographical definition", as it appears in the instant claims is uncertain. For purposes of examination, the Examiner has given this term the broadest reasonable structural interpretation. The term has accordingly been interpreted by the Examiner as referring to a surface which is non-planar, or not completely flat. Such an interpretation would make geometrically articulated amorphous material produced by a quench casting process indistinguishable from permanently deformed metallic glass sheets produced by application of force, as defined by applicants' claims. The Examiner has also equated the surface roughness features in an 'as cast' amorphous ribbon with geometrical articulation.

Each of these interpretations of the Examiner is, respectfully, traversed. There are strong differences between the geometrically articulated 'as cast' amorphous material and that produced by permanent deformation according to the subject invention. In the process disclosed by USP 4,332,848 to Narasimhan, the chill wheel is designed so that the melt can flow and replicate the shape during casting (see col. 1, lines 60 through col. 2 line 17). In that process, quench wheel depressions have different casting velocities due to wheel radius reductions at the locations of the depressions. This causes the geometrically articulated amorphous material to have a permanent curvature akin to that of the chill wheel. If the geometrically articulated ribbons are straightened by application of force, the ribbon tears or flattens out at these geometrical articulations. Non periodic geometrical articulation cannot be produced by the quenching process, since the quench wheel surface is periodically brought under the casting nozzle. The 'as cast' ribbons have trapped internal stresses induced during quenching. Such stresses are thermal contraction stresses that have different

values along different directions of the ribbon. Mechanical properties of the ribbons are correspondingly reduced due to the additive nature of the internal stresses with applied stresses. In addition the magnetic properties are reduced owing to these internal stresses, since most magnetic alloys are magnetostrictive.

The amendment to claim 1 (as well as claims 2-13 dependent thereon) imposes the restriction that the geometrical articulation is produced by the application of force. In view of this amendment, it is submitted that the subject invention called for by applicants' claims 1-13 is particularly pointed out with the clarity and precision required by 35 USC 112, second paragraph. The geometrically articulated articles defined by applicants' claims 1-13, as amended, are clearly identifiable from an as-cast product. Unlike the as-cast product, the geometrically articulated articles of applicants' claims exhibit (i) an absence of internal stresses; (ii) superior magnetic properties; (iii) non-periodic geometrical articulations. In contrast to geometric features such as surface roughness on as-cast ribbon, which do not correspond equally on opposing sides of the ribbon (i.e. the roll side of the ribbon and the free surface of the ribbon), the geometric articulations called for by applicants' claims 1-13 exhibit matching patterns. Moreover, the surface roughness features on as-cast ribbon are at best a few percent of the ribbon thickness, whereas the geometrical articulations of the subject invention produce much larger structures, having thickness much greater than the thickness of the amorphous ribbon (see, for example, Fig. 2B, 3B and 4 of applicants' specification).

These structural elements clearly distinguish claims 1-13 from those of conventional as-cast ribbon. Products containing the elements defined by claims 1-13 are differentiated by the presence of superior mechanical and magnetic properties. In addition, the production of geometrical articulations, as defined by applicants' claims, results in geometrical articulation of greater magnitude than that obtained by conventional quenching processes.

The restriction "produced by application of selected forces that introduce permanent deformation" is fully supported by page 4 lines 16-25 of the original specification. Such articulated

topographical definitions are created by the application of selected forces to a generally planar (2-dimensonal) amorphous metal foil or ribbon. These selected forces introduce permanent deformations in the ribbon that produce a non-planar (3-dimensional) amorphous metal foil or ribbon. Such deformations can include a geometric pattern, texture, profile or other feature, collectively referred to as "articulated topographical definitions". With respect to such articulated topographical definitions, it is required only that there be introduced permanent deformations which will distort or distend the generally planar amorphous metal foil or ribbon to provide a permanent non-planar three-dimensional profile.

In view of the amendments to claims 1, 4 and 5, and the remarks set forth above, it is submitted that claims 1-13 particularly point out and distincly claim the subject matter which applicant regards as the invention. Accordingly, reconsideration of the rejection of claims 1-13 under 35 USC 112, second paragraph, as being indefinite, is respectfully requested.

Claims 1-4 and 6-10 were rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 4,332,848 to Narasimhan.

The Examiner has stated that Narasimhan discloses glassy metal strips having a composition within the limitations of instant claim 4, and which contain a repeating geometrical pattern of structurally defined protuberances and/or indentations. With respect to claims 6-9, the examiner's has taken the position that the suitability of a material for abrasive or cutting purposes is directly related to its composition, shape, and relative hardness to the material being abraded or cut. Finding that all of these parameters are the same in the prior art or the claimed invention, the Examiner has held (i) that the claimed limitations are inherent in the Narasimhan material; and (ii) that the Narasimhan products fully meet the limitations of the instant claims.

Narasimhan discloses as cast material, which is geometrically articulated by having projections or depressions on a quench surface. Due to the circular or repeating nature of the quench surface only periodic structures are produced; such structures have at least the periodicity of

the quench substrate. On the other hand, plastically deformed 3 dimensional shapes of the type required by applicants' claims 1-4 and 6-10, as amended, can be impressed on an amorphous sheet in completely arbitrary non-periodic shapes. An example of a non-periodic geometric articulation is shown in Fig. 3B. On a quench surface either depressions or projections traverse below the casting nozzle at different speeds compared to the general surface of the quench wheel, based on the radius at the projection or depression. Consequently, the depressions are shorter in length compared to the flat portion of the sheet, and the sheet has a curvature similar to that of the quench wheel. Forcing the amorphous ribbon to a flat shape, generally tears the projections out. This is of course not a problem with belt casting. Accordingly, flat sheets cast on a quench wheel are not available to produce laminations. On the other hand, plastically deformed three-dimensional shapes impressed on a planar amorphous sheet can be <u>stacked to produce laminations</u> due to the sheet's lack of fixed curvature. The inherent nature of melt flow during a quench casting process creates severe limitations on the geometry of shapes that can be successfully replicated. This is discussed at col. 1, lines 60 through col. 2, line 17 of Narasimhan. If the angles deviate from the suggested values, reproduction of the three-dimensional pattern is not replicated. The geometrically articulated amorphous sheet disclosed by Narasimhan is full of thermal contraction stresses. Such contraction stresses compromise magnetic properties and result in non uniform stress needed to fracture the sheet, since internal stresses are additive with applied stresses. In order to emphasize the salient features of the present invention, claim 1, as well as dependent claims 2-4 and 6-9, have been amended to require that the articulated topographical definition be produced by application of selected forces that introduce permanent deformation. The geometrically articulated amorphous product required by claims 1-4 and 6-9, as amended, is <u>inherently different</u> from a sheet composed of as-cast material. The problems of geometry, lack of flatness, inherent periodicity of the quench surface, and thermal contraction stresses discussed hereinabove severely limit the application of geometrically articulated, as-cast amorphous metal sheets. In particular, the magnetic properties, cutting ability and wear resistance of as-cast amorphous metal sheets are severely compromised.

These factors differentiate the subject invention from the prior art cited by the examiner. As a result, the geometrically articulated amorphous metal alloys required by claim 1, as amended, exhibit excellent magnetic and mechanical properties, whereas the as-cast amorphous metal alloys disclosed by Narasimhan do not.

Claims 1, 2 and 4-13 were rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,622,768 to Watanabe et al.

The Examiner has indicated that Watanabe discloses wound or laminated magnetic cores made from amorphous alloy strips having a composition within the limitations of instant claims 4 and 5. The limitations of instant claims 6-9 are considered by the Examiner to be inherent in the Watanabe materials for the reasons set forth in connection with the rejection of claims 1-4 and 6-10 over Narasimhan. The Watanabe materials are said to have a defined surface roughness value (shown by Watanabe Table 2) and have been held by the Examiner to possess "articulated topographical definition. For these reasons, the Examiner has held that the Watanabe products fully meet the limitations of claims 1-2 and 4-13.

Watanabe uses the surface roughness of the ribbons in a laminated stack to improve the squareness of the B-H loop, especially at high frequencies. This surface roughness is produced by limiting the contact of the melt with the quench wheel to no more than 30% while, simultaneously, the free surface of the ribbon has no more roughness features than 0.30% (see col. 2 lines 12-23). The roughness on the roll side of the ribbon is inherently <u>smaller</u> than the thickness of the ribbon. Otherwise the cavity will extend to the free surface, due to the smooth character of the free surface. By way of contrast, the deformed projections required by claims 1-2 and 4-13 are <u>substantially larger</u> in scale than the ribbon thickness or any surface roughness on the roll side of a ribbon produced by casting on a rough, quench wheel (see, for example, Figs. 2B, 3B and 4). Advantageously, the deformed projections required by claims 1-2 and 4-13 as amended, result in similar geometry on <u>both</u> sides of the ribbon. These advantageous features result directly from the formation of three-dimensional features by application of forces that induce permanent deformation,

as required by applicants' claims 1-2 and 4-13, as amended. They are not produced by processes wherein the features are produced in as-cast amorphous metal during the melt quenching process.

Accordingly, reconsideration of the rejection of claims 1, 2 and 4-13 under 35 U.S.C. 102(b) as being anticipated by US Patent 5,622,768 to Watanabe et al. is respectfully requested.

Claims 1, 2 and 4-10 were rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,865,664 to Sato et al.

The Examiner has indicated that (i) Sato et al. discloses amorphous alloy strips having a composition within the limitations of instant claims 4 and 5; (ii) the limitations of instant claims 6-9 are inherent in the Sato materials for reasons as set forth hereinabove; (iii) the Sato materials have a defined surface roughness value (shown in the Tables of Sato) and possess "articulated topographical definition"; and (iv) the Sato products thus fully meet the limitations of claims 1, 2 and 4-10. ly 50 micrometers. In such cases, the surface roughness is a small fraction of the ribbon

Sato et al. uses two or more slots in the planar flow casting process to produce a thicker ribbon of amorphous material. The alloys used by Sato et al. are similar in composition to those called for by claims 4 and 5; but the surface roughness disclosed by Sato et al. is in <u>micrometers</u>, causing the thickness of the ribbon to be several hundred times the roughness. These microscopic roughness dimensions are very unlike the macroscopic roughness features required by applicants' claims 1, 2 and 4-10. Such roughness features are stamped by plastic deformation in the ribbon called for by applicants' claims, creating roughness dimensions and feature sizes much larger than the thickness of the ribbon (see Figs. 2B, 3B and 4 of applicants' specification). It is submitted that the surface roughness disclosed by Sato et al. is dissimilar to the macroscopic deformations required by present claims 1, 2 and 4-10. Each of claims 1, 2 and 4-10 requires that three-dimensional features be formed by the application of forces that induce permanent deformation. This requirement is submitted to distinguish the microscopic roughness of the as-cast amorphous metal disclosed by Sato et al.

Accordingly, reconsideration of the rejection of claims 1, 2 and 4-10 under 35 USC 102(b) as being anticipated by Sato et al. is respectfully requested.

Claims 1, 2 and 6-11 were rejected under 35 U.S.C. 102(b) as being anticipated by JP 62-250153.

The Examiner has indicated (i) that the JP '153 reference discloses laminated amorphous metal sheets with a defined surface roughness, and is the full patentable equivalent of the claimed "articulated topographical definition"; (ii) the limitations of claims 6-9 are inherent in the JP '153 materials; (iii) the products disclosed in JP '153 fully meet the limitations of the claims 1, 2 and 6-11.

Applicants note that the surface roughness of an amorphous metal is controlled to a value of 0.2 to 10 micrometers and the thickness of an amorphous alloy cast on a single roll quench casting is typically 50 micrometers. In such cases, the surface roughness is a small fraction of the ribbon thickness and is not projected through the thickness of the ribbon. On the other hand, the latter feature is produced by application of forces that induce permanent deformation. It is submitted that the microscopic roughness features disclosed by JP '153 are very different from the macroscopic three-dimensional features formed by permanently deforming a planer metallic glass sheet as required by present claims 1, 2 and 6-11.

Claim 5 was rejected under 35 U.S.C. 103(a) as being unpatentable over Narasimhan in view of Watanabe et al. or Sato et al.

The Examiner has indicated (i) that the Narasimhan products do not contain element "Z", which element is required by claim 5; (ii) it is unclear whether or not this element is required in the claimed products, for reasons previously stated in the rejection under 35 USC 112; and (iii) the Wantanabe and Sato et al. patents indicate that it is conventional in the art to include element "Z" in amorphous alloy strip compositions, in the amounts required by claim 5.

As previously noted, Narasimhan produces geometrically articulated amorphous ribbons produced during quenching a metal composition to the amorphous state. On the other hand, claim 5 requires the amorphous planar material to be deformed by the application of force; and such deformation entails significantly more than a melt quenching operation. Unlike Narasimhan and Watanabe et al., the geometrically articulated amorphous metal called for by claim 5, as amended, is not produced during casting. Rather it is produced by deforming a flat amorphous metal ribbon under appropriate conditions that cause permanent deformation of the ribbon and impress the desired geometrical articulations.

The Examiner has stated that Watanabe and Sato et al. disclose that it is conventional in the art to include element 'Z' in amorphous alloy strip compositions, in the amounts as defined by claim 5; consequently, the Watanabe or Sato disclosures would have motivated one of ordinary skill in the art to produce the Narasimhan products containing an amount of element 'Z'.

As noted hereinabove, the requirements of the alloy called for by claim 5 involve not only quenchability; but also permanent deformation by forces that create the geometrical articulations. Each of Watanabe and Sato et al. disclose alloys having additions of element 'Z' to improve quenchability; but none of these patentees disclose use of the "Z" element to provide superior permanent deformability upon application of force. On the other hand, the amorphous metal alloy article called for by claim 5, as amended, does not cast geometrically articulated amorphous metal ribbon. Instead, such ribbon is permanently deformed by forces that impress the desired geometrical articulations.

Accordingly, reconsideration of the rejection of claim 5 under 35 U.S.C. 103(a) as being unpatentable over the combination of Narasimhan, Watanabe et al. and Sato et al. is respectfully requested.

Claims 11-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Narasimhan in view of either Watanabe et al or US Patent 4,853,292 to Bruckner.

The Examiner has indicated (i) that Narasimhan does not discuss a plurality of stacked materials or transformer cores, as required by claims 11-13; (ii) both Watanabe and Bruckner indicate it to be conventional in the art to form laminated magnetic cores by using a plurality of layers of amorphous metal alloys; (iii) these disclosures would have motivated one of ordinary skill in the art to form the materials disclosed by Narasimhan into the configurations set forth by Watanabe or Bruckner.

Neither Narasimhan nor Watanabe and Bruckner disclose permanently deformed metallic glass strip having macroscopic geometric articulation for laminated cores. Narasimhan's as-cast amorphous material is unsuitable for producing laminated cores, due to several reasons. First, the thermal contraction strains produce poor magnetic properties. Ribbon curvature, inherently produced when the ribbon is cast on a quench wheel, prevents stackability of as-cast, geometrically articulated amorphous metal ribbons. This stackability problem would impair production of an article that comprises a plurality of self-nesting amorphous metal articles, as called for by applicants' claim 11. The material taught by Watanabe et al. and Bruckner has <u>microscopic</u> surface roughness, <u>not macroscopic</u> geometric articulations, as required by claims 12-13, as amended. Since the articles produced by Watanabe et al. and Bruckner are <u>as-cast products</u>, they contain <u>thermal contraction strains</u> with <u>poor magnetic properties</u> when laminated. By way of contrast, the article of claims 11 and 13 comprises stackable flat ribbons with geometrical articulation in a relaxed state, thereby providing a self-nesting feature not disclosed or suggested by the art applied. The amendment of claim 1, which requires that the amorphous metal material be permanently deformed, distinguishes the subject matter of claims 12 and 13 from the cited references. It also distinguishes the subject matter of claim 11, since geometrical articulations caused by permanent deformation have fixed dimensions, free from edge burs and other imperfections (which are typically found in as-cast products). These features significantly improve stackability, thereby enabling articles having articulated topographical definition to be self-nesting.

The Examiner has advised that should claim 2 be found allowable, claim 10 will be objected to under 37 CFR 175 as being a substantial duplicate thereof. In view of the cancellation of claim 10, it is submitted that this objection has been obviated.

In view of the elections taken herein, the amendments to the claims and the remarks set forth above, it is submitted that this application is in allowable condition. Accordingly, reconsideration of the rejection of claims 1-9 and 11-13, as amended, and allowance of the application are earnestly solicited.

Respectfully submitted,
Howard H. Liebermann et al.

By: [signature]
Ernest D. Buff
(Their Attorney)
Reg. No. 25,833
(973) 644-0008

Amended Claims – With Markings To Show Changes Made

What is claimed is:

1. <u>(Amended)</u> An amorphous metal alloy article having an articulated topographical definition <u>produced by application of selected forces that induce permanent deformation</u>.

2. An amorphous metal alloy article according to claim 1 which comprises a plurality of articulated topographical definitions.

3. An amorphous metal alloy article according to claim 1 which comprises a plurality of geometrically repeating articulated topographical definitions.

4. <u>(Amended)</u> An amorphous metal alloy article having an articulated topographical definition wherein the amorphous metal alloy has a composition ~~which may be represented~~<u>defined</u> by the formula:

$$M_k Y_p$$

wherein:

M is a metal selected from one or more of the group consisting of Fe, Ni, Co, V and Cr;

Y represents one or more elements from the group consisting of P, B and C;

k represents atomic percent, and has a value of from about 70 – 85;

p represents atomic percent, and has a value of about 15 – 30;

5. <u>(Amended)</u> An amorphous metal alloy article having an articulated topographical definition wherein the amorphous metal alloy has a composition ~~which may be represented~~<u>defined</u> by the formula:

$$M_a Y_b Z_c$$

wherein:

M is a metal selected from one or more of the group consisting of Fe, Ni, Co, V and Cr;

Y represents one or more elements from the group consisting of P, B and C;

Z is one or more elements selected from the group Al, Si, Sn, Ge, In, Sb or Be;

a represents atomic percent and has a value of from about 60 – 90;

b represents atomic percent and has a value of from about 10 – 30;

c represents atomic percent and has a value of from about 0.1 – 15;

and, a+b+c = 100.

6. An abrasive article which comprises the amorphous metal alloy article having an articulated topographical definition according to claim 1.

7. An abrasive article which comprises the amorphous metal alloy article having a plurality of an articulated topographical definition according to claim 2.

8. A cutting article which comprises the amorphous metal alloy article having an articulated topographical definition according to claim 1.

9. A cutting article which comprises the amorphous metal alloy article having a plurality of an articulated topographical definition according to claim 2.

~~10. A amorphous metal alloy article having an articulated topographical definition according to claim 2.~~

11. An article which comprises a plurality of self-nesting amorphous metal alloy articles.

12. A wound transformer core according to claim 2.

13. A stacked transformer core according to claim 2.

14. A process for the manufacture of an amorphous metal alloy article having an articulated topographical definition which comprises the steps of:

heating the amorphous metal alloy article to an elevated temperature and subsequently stamping or otherwise deforming the heated amorphous metal alloy article in a die.

15. The process according to claim 14 wherein the die is preheated.

16. The process according to claim 14 wherein the die is a roller die or a stamping die.

17. The process according to claim 14 wherein at last part of the articulated topographical definitions are selectively crystallized.

18. The process according to claim 14 wherein at last part of the articulated topographical definitions are ground to remove a part of the articulated topographical definitions.

19. The process according to claim 14 wherein an abrasive material is adhered to at least the articulated topographical definitions of the amorphous metal alloy article.

What is claimed is:

1. (Amended) An amorphous metal alloy article having an articulated topographical definition produced by application of selected forces that induce permanent deformation.

2. An amorphous metal alloy article according to claim 1 which comprises a plurality of articulated topographical definitions.

3. An amorphous metal alloy article according to claim 1 which comprises a plurality of geometrically repeating articulated topographical definitions.

4. (Amended) An amorphous metal alloy article having an articulated topographical definition wherein the amorphous metal alloy has a composition defined by the formula:

$$M_k Y_p$$

wherein:

M is a metal selected from one or more of the group consisting of Fe, Ni, Co, V and Cr;

Y represents one or more elements from the group consisting of P, B and C;

k represents atomic percent, and has a value of from about 70 – 85;

p represents atomic percent, and has a value of about 15 – 30;

5. (Amended) An amorphous metal alloy article having an articulated topographical definition wherein the amorphous metal alloy has a composition defined by the formula:

$$M_a Y_b Z_c$$

wherein:

M is a metal selected from one or more of the group consisting of Fe, Ni, Co, V and Cr;

Y represents one or more elements from the group consisting of P, B and C;

Z is one or more elements selected from the group Al, Si, Sn, Ge, In, Sb or Be;

a represents atomic percent and has a value of from about 60 – 90;

b represents atomic percent and has a value of from about 10 – 30;

c represents atomic percent and has a value of from about 0.1 – 15;

and, a+b+c = 100.

6. An abrasive article which comprises the amorphous metal alloy article having an articulated topographical definition according to claim 1.

7. An abrasive article which comprises the amorphous metal alloy article having a plurality of an articulated topographical definition according to claim

29. The process according to claim 14 wherein an [illegible] adhered to at least the articulated topographical defi[illegible]

8. A cutting article which comprises the amorphous metal alloy article having an articulated topographical definition according to claim 1.

9. A cutting article which comprises the amorphous metal alloy article having a plurality of an articulated topographical definition according to claim 2.

11. An article which comprises a plurality of self-nesting amorphous metal alloy articles.

12. A wound transformer core according to claim 2.

13. A stacked transformer core according to claim 2.

14. A process for the manufacture of an amorphous metal alloy article having an articulated topographical definition which comprises the steps of:

heating the amorphous metal alloy article to an elevated temperature and subsequently stamping or otherwise deforming the heated amorphous metal alloy article in a die.

15. The process according to claim 14 wherein the die is preheated.

16. The process according to claim 14 wherein the die is a roller die or a stamping die.

17. The process according to claim 14 wherein at last part of the articulated topographical definitions are selectively crystallized.

18. The process according to claim 14 wherein at last part of the articulated topographical definitions are ground to remove a part of the articulated topographical definitions.

19. The process according to claim 14 wherein an abrasive material is adhered to at least the articulated topographical definitions of the amorphous metal alloy article.